Idea of the limit/limits from tables

The limit of a function is the value the function approaches at a given value of x, regardless of whether the function actually reaches that value.

For an easy example, consider the function

$$f(x) = x + 1$$

When $x = 5$, $f(x) = 6$. Therefore, 6 is the limit of the function at $x = 5$, because 6 is the value that the function approaches as the value of x gets closer and closer to 5.

I know it's strange to talk about the value that a function "approaches." Think about it this way: If you set $x = 4.9999$ in the function above, then $f(x) = 5.9999$. Similarly, if you set $x = 5.0001$, then $f(x) = 6.0001$.

You can begin to see that as you get closer to $x = 5$, whether you're approaching it from the 4.9999 side or the 5.0001 side, the value of $f(x)$ gets closer and closer to 6.

x	4.9999	5.0000	5.0001
$f(x)$	5.9999	6.0000	6.0001

In this simple example, the limit of the function is clearly 6 because that is the actual value of the function at that point; the point is defined. However, finding limits gets a little trickier when we start dealing with points of the graph that are undefined.

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